REMARKS

Claims 16, 18 and 22 to 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over the alleged admitted prior art (APA) in view of U.S. Patent No. 5,735,978 to Mardon et al. (hereinafter "Mardon") alone or in combination with either U.S. Patent No. 3,336,201 to Graham (hereinafter "Graham") or U.S. Patent No. 3,776,508 to Katz (hereinafter "Katz").

Claims 16 and 25 have been amended to correct a grammatical error.

Reconsideration of the application based on the following remarks is respectfully requested.

35 U.S.C. 103(a) Rejections

Claims 16, 18 and 22 to 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over APA in view of Mardon alone or in combination with either Graham or Katz.

The APA identified by the Examiner includes the steps of preparing, casting and shaping a zirconium alloy ingot into a flat arrangement.

Mardon discloses "a method of manufacturing a tube suitable for use as a sheath of a nuclear fuel rod zirconium based alloy." "A drawn blank is subjected to successive passes of metallurgical treatment and of heat treatment." (See Abstract).

Graham discloses "a method for extending the burn-up of nuclear fuel by first utilizing it in one type of reactor and then utilizing it further in another type of reactor." (Col. 1, lines 9 to 13).

Katz discloses a "method of hydriding uranium-zirconium alloy by heating the alloy in a vacuum, introducing hydrogen and maintaining an elevated temperature until occurrence of the beta-delta phase transformation and isobarically cooling the composition." (See Abstract).

Both claim 16 and 25 have been amended to correct a grammatical error. Claims 16 and 25 now includes the requirements of (1) "subjecting the flat arrangement, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate

annealing, the rolling performed at a temperature lying in a range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%" ("the rolling operation step"); and (2) "subjecting the rolled flat arrangement to an annealing treatment in the α range or in the α + β range, performed in a temperature range 500°C to 800°C for 2 min to 10 h" ("the annealing treatment step").

The APA does not show either the rolling operation step or the annealing treatment step required by claims 16 and 25.

Mardon clearly is used by the Office Action to teach the rolling operation step. (See the February 28, 2008 Office Action, p. 5). It is respectfully submitted that it would not have been obvious to one of skill in the art to combine processing steps performed on the flat arrangement generated in the APA and with processing steps performed on the tubes of Mardon. Furthermore there is no reason or motivation to modify the processing steps performed in the APA in view of the processing steps performed on the tubes of Mardon. As evident, the processes performed in generating the flat arrangements and the tubes are different. One of skill in the art would have no reason to combine the teachings relative to the processing performed in creating tubes such as disclosed in Mardon with the processing performed in generating the flat arrangements of APA. It is known by one of skill in the art that the deformation process and annealing textures are more complex with tubes than with sheet arrangements, see, for example. the American Society for Testing and Materials (ASTM) technical publication "Deformation Mechanisms, Texture, and Anisotropy in Zirconium and Zircaloy." This publication teaches that "for example, [in] the relatively simple process of sheet rolling, the forces acting during deformation cannot be given precisely. For deformation process such as tube drawing and rocking, the interaction of forces is even more complicated." (See Paragraph 2.3.4). In chapter 3.5 the publication teaches "[t]he annealing textures in tubing appear to be more complex than those of rolled and annealed sheet. In tubing, different features of annealing textures can develop, depending on the relative reductions in wall thickness and diameter, the degree of deformation, the temperature of deformation, and the deformation method before annealing (extruding, rocking, drawing)." (See also "Zirconium Alloy Cold Pilgering Process Control by

Modeling"). It is clear from these publications that the process of shaping of flat products as in the present invention involves a completely different deformation mode than the process of shaping tubes such as disclosed in Mardon. The January 12, 2009 Office Action asserts on page 2 and 3 that the "tubes have more complex attributes than sheets, an artisan would also have even more incentive to try the known option to a flat arrangement." However, because tubes and flat arrangements have such different deformation processes and annealing textures, one of skill in the art would not foresee a process valid for long tube products would also have been valid for flat products. It is respectfully submitted there is no reason or motivation to combine such different technical specimens (and the Examiner has clearly not demonstrated any such reason or motivation).

It is further respectfully submitted that it would not have been obvious to one of skill in the art to combine the references of Mardon with Graham or Katz to achieve the claimed invention in view of the tube-shaped structure. There also is no motivation or reason to combine Mardon and Graham or Mardon and Katz with the APA. Although it is known that different configurations are available for nuclear fuel elements, there are different ways to manufacture such pieces. Mardon is a method for manufacturing tubes. Mardon's teachings are thus simply not relevant to flat arrangement processing of the APA, regardless of the Graham or Katz teaching which do not address the APA steps. Furthermore, Katz fails to teach the use of alloys with at least 95% of Zr for making fuel elements in Zr-U alloy

As mentioned above, both Mardon and the APA fail to teach or show the rolling operation step because, among other reasons, neither shows "a reduction ratio lying in a range 2% to 20%" as required by claims 16 and 25. Mardon's tubes are drawn into blanks, and this different shaping process would not result in the same structure or in the claimed "reduction ratio" range of 2 to 20 percent.

In fact, there simply is no teaching or disclosure in any of the prior art of a reduction ratio of 2 and 20 percent for flat arrangements nor has the Office Action cited any references which demonstrate this claim requirement. This is not a mere obvious variant but a substantive claim limitation in the context of a specific claimed rolling operation. On this basis alone, withdrawal of the rejection is respectfully requested.

Furthermore, the Examiner asserts on page 3 and 4 of the Office Action "that the reduction ratio is a design requirement that depends on the final dimensions of the final product," that the "reduction ration is a matter of optimization," and "[t]he final dimensions of the final product are clearly result-effective variables." As previously discussed, the final product dimensions are only one parameter of a combination of features which define the process and cannot be isolated just because its choice would depend on the final dimensions required for the finished product. The reduction ratio is given in a range because of structural differences that may occur in the product. However this range is a critical limitation in the present invention. For example, a reduction ratio above 20% is not considered satisfactory, the reduction ratio should be less in order to ensure good isotropy. (See the specification paragraph [0088]).

Withdrawal of the rejection of independent claims 16 and 25 and dependent claims 18, 22 to 24 and 26 under 35 U.S.C. §103(a) is respectfully requested.

CONCLUSION

It is respectfully submitted that the application is in condition for allowance and applicants respectfully request such action.

If any additional fees are deemed to be due at this time, the Assistant Commissioner is authorized to charge payment of the same to Deposit Account No. 50-0552.

Respectfully submitted,

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By: _____

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